



Harmostes Burmeister, 1835 (Hemiptera, Heteroptera, Rhopalidae): new records, with an emphasis in the southernmost region of Brazil

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Abstract

Harmostes Burmeister, 1835 (Rhopalidae, Rhopalinae) comprises 32 species distributed from Canada to southern South America. From the analysis of material deposited in collections, we identified and diagnosed the species of *Harmostes* from the state of Rio Grande do Sul. Among the analyzed material, seven species of *Harmostes* are included, six of them being reported from the state for the first time. The known geographical distribution in other Brazilian regions was also expanded for *H. (H.) serratus* (Fabricius, 1775) (Amapá, Amazonas, Santa Catarina), *H. (N.) apicatus* Stål, 1859 (Mato Grosso do Sul), and *H. (H.) incisuratus* Distant, 1881 (Santa Catarina).

Keywords

Distribution, Harmostini, male genitalia, Neotropics, taxonomy

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Introduction

Rhopalidae is a family of terrestrial Heteroptera with a pantropical distribution and composed of 23 genera and 233 species (Coreoidea SF 2020). The popular name “scentless plant bugs” for this family of Heteroptera is inaccurate since varying degrees of development of odoriferous glands are present in the group (Aldrich et al. 1990). Rhopalidae is divided into Serinethinae, whose individuals do not present the ostioles of the metathoracic glands, and Rhopalinae, which are characterized by the presence, even if barely visible, of the ostioles between the meso- and metacoxae (Fowles et al. 2015).

Harmostes Burmeister, 1835 belongs to the subfamily Rhopalinae, tribe Harmostini, and occurs in the Americas from Canada to southern South America. It

comprises the subgenera *Harmostes*, with 20 described species, *Neoharmostes* Göllner-Scheiding, 1978, with 11 species, and *Harmostes montanus* Grillo & Alayo, 1978, *incertae sedis* (Coreoidea SF 2020). According to Göllner-Scheiding (1978), individuals of the genus have colors ranging from yellow, brown to reddish-brown and are characterized by the robust spines present in the posterior femora. The subgenus *Harmostes* is characterized by the greater sclerotization of the hemelytra and the alternating rows of spines in the metafemora, while *Neoharmostes* presents less sclerotized hemelytra and only a central row of spines; in the latter, the smallest species of the genus are found (Göllner-Scheiding 1978). In the male external genitalia, the species of the nominal

subgenus have the median extension of the ventral rim and the ventrally visible phragmal processes, which are not visible in *Neoharmostes*.

There are few records of *Harmostes* in southern Brazil in the literature, especially from Rio Grande do Sul. Only *Harmostes (Harmostes) prolixus* Stål, 1860 has been reported so far from the state (Blöte 1934). The other species listed for the country by Fowles et al. (2015) have not yet been recorded from Rio Grande do Sul. This may reflect the lack of specialists in Rhopalidae in the country.

From the analysis of the specimens deposited in scientific collections of Rio Grande do Sul, we identified, listed, and morphologically characterized the species of *Harmostes* occurring in the state. We also expand the known geographical distribution in Brazil of the species. In addition, some diagnostic traits pointed out by Göllner-Scheiding (1978, 1979) are revised and reinterpreted.

Methods

We examined 252 specimens of the genus *Harmostes* deposited in the collections of the Museu de Ciências Naturais, Secretaria do Meio Ambiente e Infraestrutura do Rio Grande do Sul (MCNZ), Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, PUCRS (MCTP), and the Universidade Federal do Rio Grande do Sul, UFRGS (UFRG). The type material of *Harmostes (Harmostes) gravidator* (Fabricius, 1794), *H. (H.) parafraterculus* Göllner-Scheiding, 1978, *H. (H.) prolixus* Stål, 1860, *H. (Neoharmostes) apicatus* Stål, 1859, and *H. (H.) procerus* Berg, 1878 was examined from photos from the collections: American Museum of Natural History, Swedish Museum of Natural History, Museo de La Plata, and Natural History Museum of Denmark.

The specimens were examined using stereomicroscope and digital images obtained with a Motorola E5 smartphone coupled to the eyepiece and edited with Adobe Photoshop 2020. We made drawings with a camera lucida coupled to the stereomicroscope, and then digitized and vectorized them in Adobe Illustrator 2020.

For the study of the genitalia, the specimens were dissected, and the genitalia prepared with hot 10% KOH solution and then kept in liquid glycerin (e.g., Costa and Barcellos 2017). The terminology of genitalia follows Dupuis (1970) and Göllner-Scheiding (1978, 1979). Measurements (minimum and maximum values, in mm) were taken as follows: total length, in ventral view, from the anterior edge of the rostrum to the posterior margin of the last abdominal segment; total width, in ventral view, across lateral margins of the fourth sternite; pronotum length in the middle; pronotum width across humeri; length of the antennifers, from the anterior margin of the eyes to their apex.

The label data were checked and used to build the distribution map, with QGIS v. 2.18 Las Palmas, shapefiles of Rio Grande do Sul and Santa Catarina (IBGE

2020), and Pampa Biome (Assis et al. 2019) (Fig. 1). New state records are indicated in the Brazilian distribution along the text with an asterisk (*) and in the maps with a star.

Results

Based on the examined deposited material, we identified seven species of *Harmostes* from Rio Grande do Sul; five belong to the nominal subgenus and two of the subgenus *Neoharmostes*. Their known geographical distribution is also expanded with new records from other Brazilian regions, as follows: *Harmostes (H.) serratus* (Fabricius, 1775) (Amapá, Amazonas, Santa Catarina); *H. (Neoharmostes) apicatus* Stål, 1859 (Mato Grosso do Sul), and *H. (H.) incisuratus* Distant, 1881 (Santa Catarina).

Harmostes (Harmostes) gravidator (Fabricius, 1794)

Figures 1A, H, 2

New records (state). BRAZIL – Rio Grande do Sul • Derrubadas, Parque Estadual do Turvo; 27°10'09.4"S, 053°51'08.0"W; 21.X.2004; L. Schmidt & L. Podgaisky leg.; 2 ♂, MCNZ 176999, 176996; 7 ♀, MCNZ 176994, 176995, 176998, 176997, 176993, 176992, 177000 • same locality; 27°13'26.4"S, 053°51'02.8"W; same date; same collectors; 3 ♀, MCNZ 176867, 176866, 176864; 4 ♂, 176862, 176861, 176863, 176865 • same locality; same date; A. Barcellos & R. Ott leg.; 1 ♀, MCNZ 177015 • same locality; same date; A. Barcellos, R. Ott & I. Heydrich leg.; 2 ♂, MCNZ 176830, 176831 • same locality; 27°09'53.0"S, 053°51'28.0"W; same date; same collectors; 2, ♂ MCNZ 176944, 176945; 1 ♀, MCNZ 176943 • same locality; 27°13'19.6"S, 053°51'06.1"W; same date; same collectors; 3 ♂, MCNZ 176904, 176907, 176906; 2 ♀, MCNZ 176905, 176903 • same locality; same date; L. Schmidt & L. Podgaisky leg.; 2 ♀, MCNZ 176888, 176889 • same locality; 27°12'38.5"S, 053°51'15.3"W; 20.X.2004; same collectors; 5 ♀, MCNZ 176629, 176626, 176627, 176628, 176630 • same locality; same date; A. Barcellos, R. Ott & I. Heydrich leg.; 1 ♀, MCNZ 176665 • same locality; 27°08'09.9"S, 053°52'32"W; same date; same collectors; 1 ♂, MCNZ 176741 • same locality; same date; L. Schmidt & L. Podgaisky leg.; 1 ♂, MCNZ 176786 • same locality; 27°09'11.0"S, 053°51'48.7"W; 07.V.2004; same collectors; 1 ♀, MCNZ 175499 • same locality; 27°08'53.9"S, 053°52'00.5"W; same date; A. Barcellos, R. Ott & I. Heydrich leg.; 1 ♀, MCNZ 176063 • same locality; 27°11'18.3"S, 053°50'38.4"W; 05.V.2004; same collectors; 1 ♀, MCNZ 175969 • same locality; 27°12'07.4"S, 053°50'53.4"W; same date; same collectors; 1 ♂, MCNZ 175810 • same locality; 27°11'58.0"S, 053°50'42.8"W; 29.X.2003; same collectors; 1 ♀, MCNZ 175015 • same locality; 27°12'34.3"S, 053°51'18.1"W; 31.X.2003; same collectors; 1 ♂, MCNZ 175065 • same locality; 27°14'08.2"S, 053°58'39.4"W; 22.X.2004; same collectors; 1 ♀, MCNZ 177098 • same locality; 27°14'48.9"S, 53°57'36.7"W; same date; same collectors; 3 ♀, MCNZ 54676, 54675, 54677 • same locality,

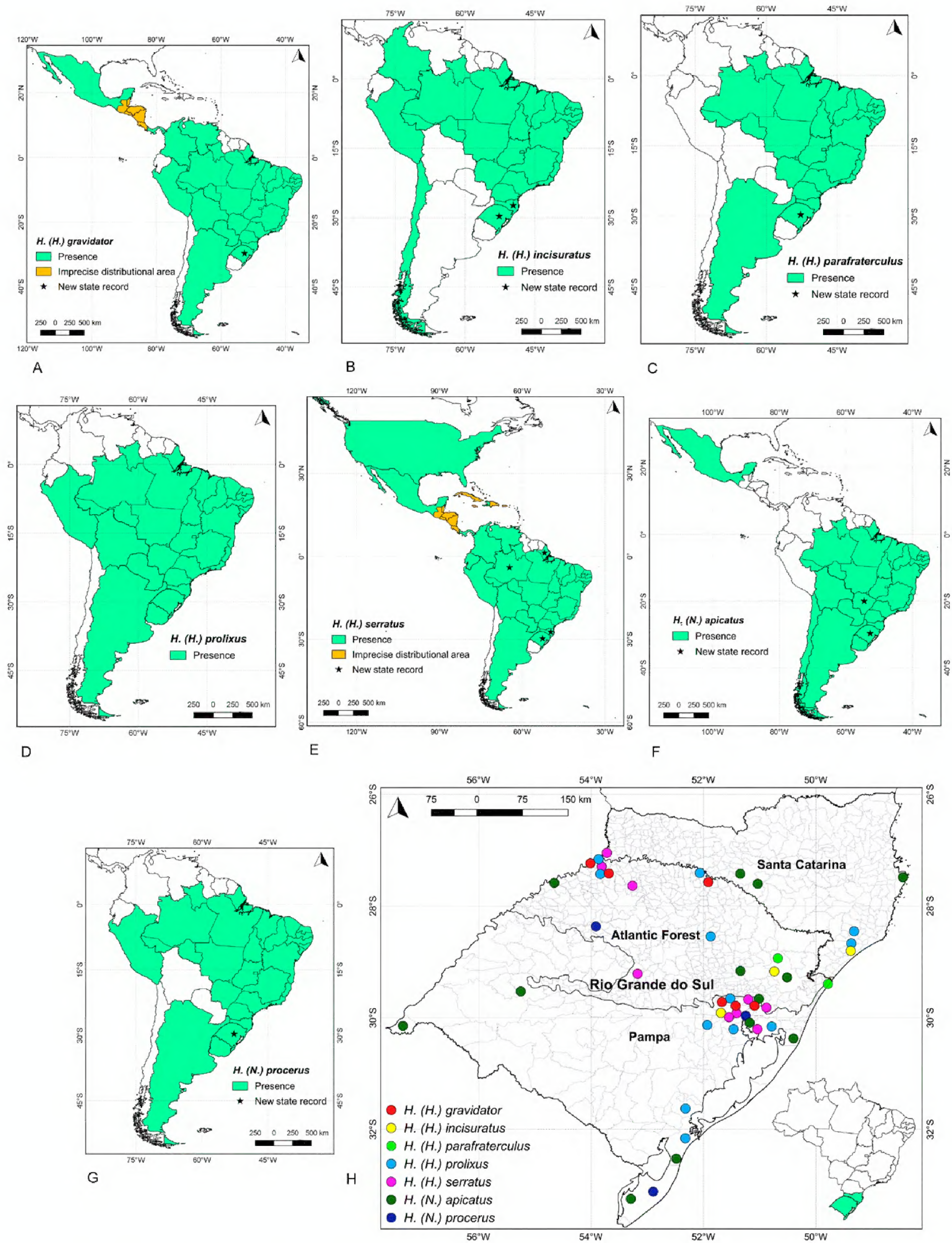


Figure 1. A–G. Distribution maps (country records) of *Harmostes* spp. occurring in Rio Grande do Sul (Brazil). **A.** *Harmostes* (*H.*) *gravidator*. **B.** *Harmostes* (*H.*) *incisuratus*. **C.** *Harmostes* (*H.*) *parafraterculus*. **D.** *Harmostes* (*H.*) *prolixus*. **E.** *Harmostes* (*H.*) *serratus*. **F.** *Harmostes* (*N.*) *apicatus*. **G.** *Harmostes* (*Neoharmostes*) *procerus*. New records in the distribution areas (green) are represented by stars; in orange, areas where the region but no country is mentioned. **H.** New records of *Harmostes* in the states of Rio Grande do Sul and Santa Catarina.

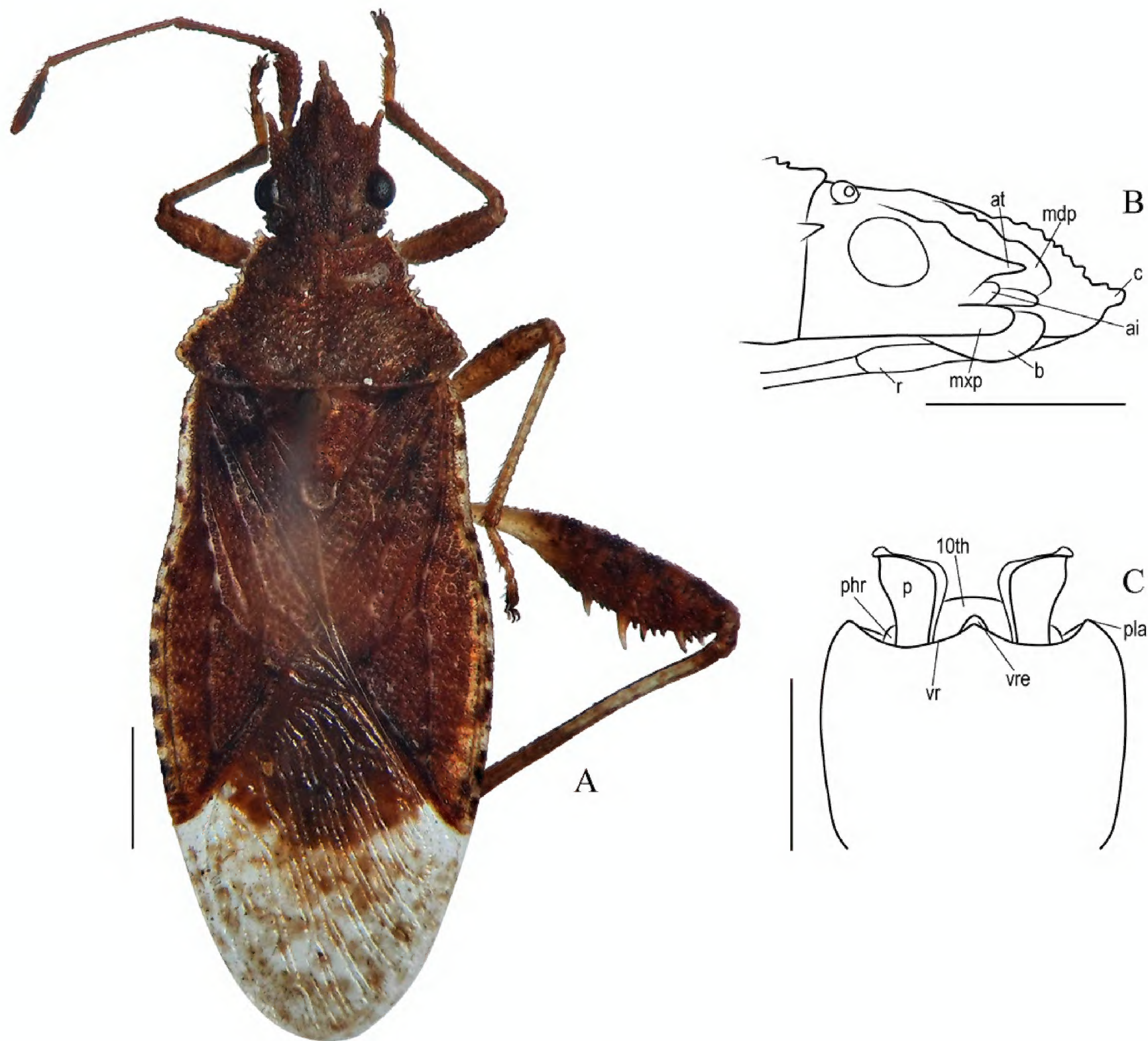


Figure 2. *Harmostes (Harmostes) gravidator* (Fabricius, 1794). **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: ai, antennal insertion; at, antennal tubercle; b, buccula; c, clypeus; phr, phragmal processes; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim; vre, ventral rim extension; 10th, tenth segment. Scale bars: A, B = 1 mm; C = 0.5 mm.

Trilha para Salto do Yucumã; 20.X.2004; same collectors; 1 ♀, MCNZ 176811; 1 ♂, MCNZ 176812 • Marcelino Ramos; 06.XII.1939; 1 ♀, MCNZ 5441 • Montenegro; 06.X.1977; A. Lise leg.; 1 ♀, MCNZ 11621 • same locality; 01.XII.1977; E.H. Buckup leg.; 1 ♂, MCNZ 11624 • São Leopoldo; 25.X.1950; 1 ♀, MCNZ 14707 • Tenente Portela; 15.I.1985; T. Arigony leg.; 1 ♀, MCNZ 48474 • same locality; same date; A. Lise leg.; 1 ♀, MCNZ 48478 • Triunfo; 12.V.1981; M.H. Galileo leg.; 1 ♀, MCNZ 45998 • same locality, Parque Copesul; 30.IV.2003; T. Aguzzoli & A. Barcellos leg.; 1 ♂, MCNZ 53547.

Other material examined. **Type material.** Lectotype ♂; labeled: Insular America, Natural History Museum of Denmark, Copenhagen (ZMUC 00101234); photo examined • paralectotype ♀: labeled. Insular America, Natural History Museum of Denmark, Copenhagen (ZMUC 00101235); photo examined.

Distribution. Mexico, Central America, Venezuela, Colombia, Brazil, Peru, Bolivia (Göllner-Scheiding 1978), Paraguay (Melo and Montemayor 2015), and Argentina

(Göllner-Scheiding 1978; Pall and Coscarón 2012).

Brazilian distribution. Rio Grande do Sul*.

Identification. Head (Fig. 2A, B). Clypeus elongated, acute in lateral view, with crenulations and dorsal spines, reaching the apical quarter of the first antennal segment. Antennal tubercles measuring 0.43–0.53 mm from the anterior margin of the eye to the apex and slightly diverging apically, reaching the apical fourth of the mandibular plates.

Thorax (Fig. 2A). Pronotum (1.1–1.4 mm long and 2.2–2.7 mm wide) with anterior margin sub-rectilinear. Anterolateral angles non prominent. Less robust spines along the anterolateral margins, which are concave. Slightly pointed humeri. Scutellum apex about $\frac{1}{3}$ of the base width. Hemelytra. Costal margins of corium punctate, variable intra- and inter-specifically, slightly sinuous, and convex.

Male genitalia (Fig. 2C). Ventral rim of the pygophore sinuous, with median third acute, and median extension slightly pointed. Posterolateral angles of the same size as

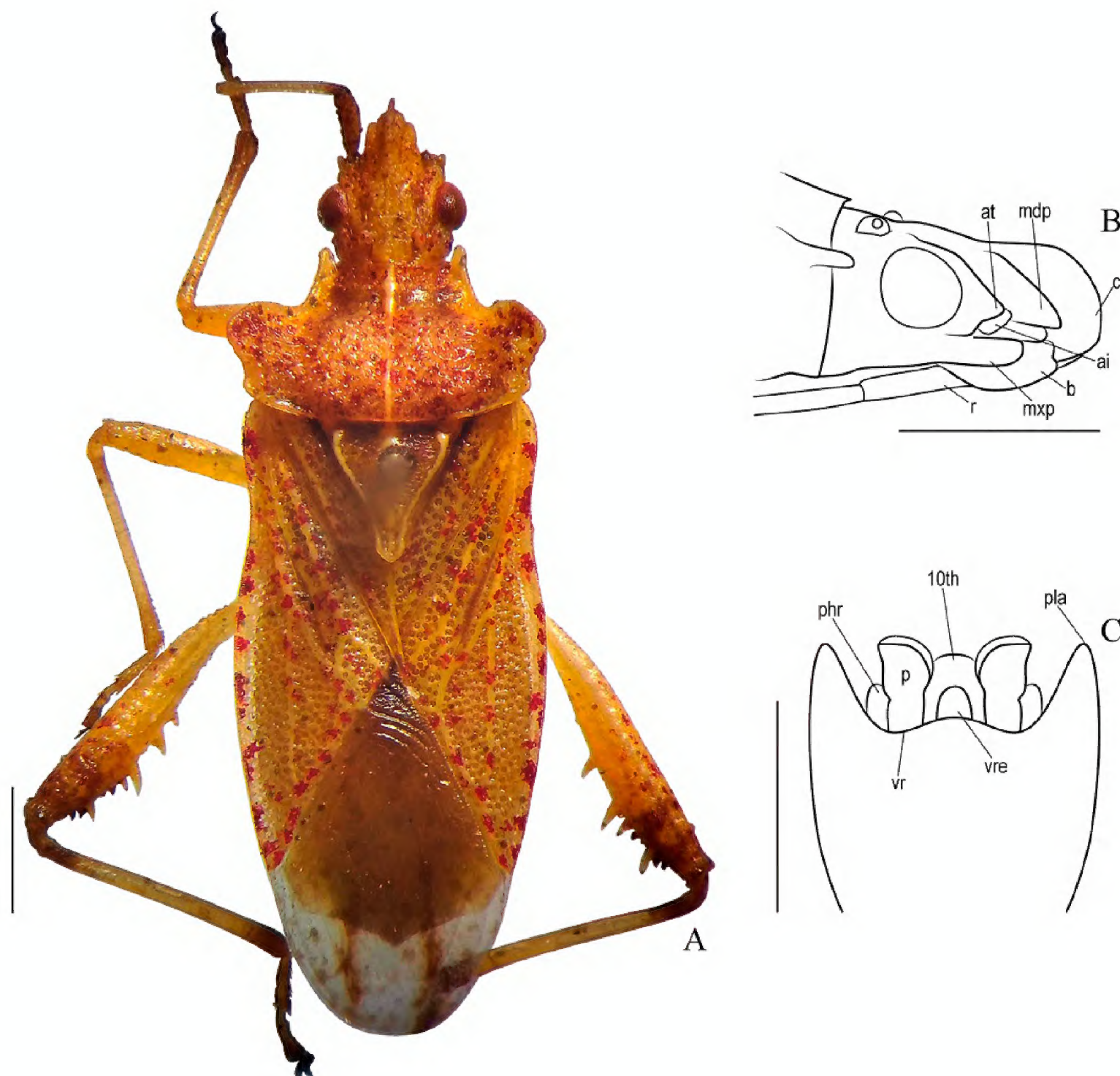


Figure 3. *Harmostes (Harmostes) incisuratus* Distant, 1881. **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: ai, antennal insertion; at, antennal tubercle; b, buccula; c, clypeus; phr, phragmal processes; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim; vre, ventral rim extension; 10th, tenth segment. Scale bars: A, B = 1 mm; C = 0.5 mm.

phragmal processes. Parameres stout and apically truncated; outer lateral margins angled. Tenth segment visible ventrally.

Males are 6.1–6.7 mm long and 2.2–2.5 mm wide, and females 6.9–7.6 mm long and 2.2–2.7 mm wide. Color ranging from light brown to dark brown (Fig. 2A).

Comments. The spines of the anterolateral margins of the pronotum are different from the Göllner-Scheiding (1978: fig. 30) illustration and intraspecifically variable in size, number, and arrangement. Thus, other traits should be considered to better distinguish between species.

Harmostes (Harmostes) incisuratus Distant, 1881

Figures 1B, H, 3

New records. BRAZIL – Santa Catarina • Criciúma, Parque José Milaneze; 22.XI.2005; T. Bertolin leg.; 1 ♀, UFRG • same locality; 23.XI.2005; same collector; 1 ♂, UFRG – Rio Grande do Sul • São Francisco de Paula; 05.I.1985; A. Lise leg.; 1 ♂, MCNZ 48532 • Triunfo, Parque Copesul, GCE Trilha do Pórtico; 28.V.2007;

L. Schmidt leg.; 1 ♀, MCNZ 179918 • same locality; 12.XI.2007; A. Barcellos leg.; 2 ♂, MCNZ 180290, 180049.

Distribution. Colombia, Brazil, Peru, and Chile (Göllner-Scheiding 1978).

Brazilian distribution. Santa Catarina*; Rio Grande do Sul*

Identification. Head (Fig. 3A, B). Clypeus rounded and robust in lateral view, reaching the length of the apical quarter of the first antennal segment. Antennal tubercles (0.16–0.2 mm) reaching only the base of the mandibular plates.

Thorax (Fig. 3A). Pronotum (0.94–1.27 mm long and 1.78–2.45 mm wide) with anterior margin straight, anterolateral angles acute, directed forwards, anterolateral margins rectilinear, in a marked angle with the projected and truncated humeri. Scutellum apex subtriangular, about $\frac{1}{4}$ of the base width. Hemelytra with costal margin sinuous.

Male genitalia (Fig. 3C). Ventral rim of the pygophore

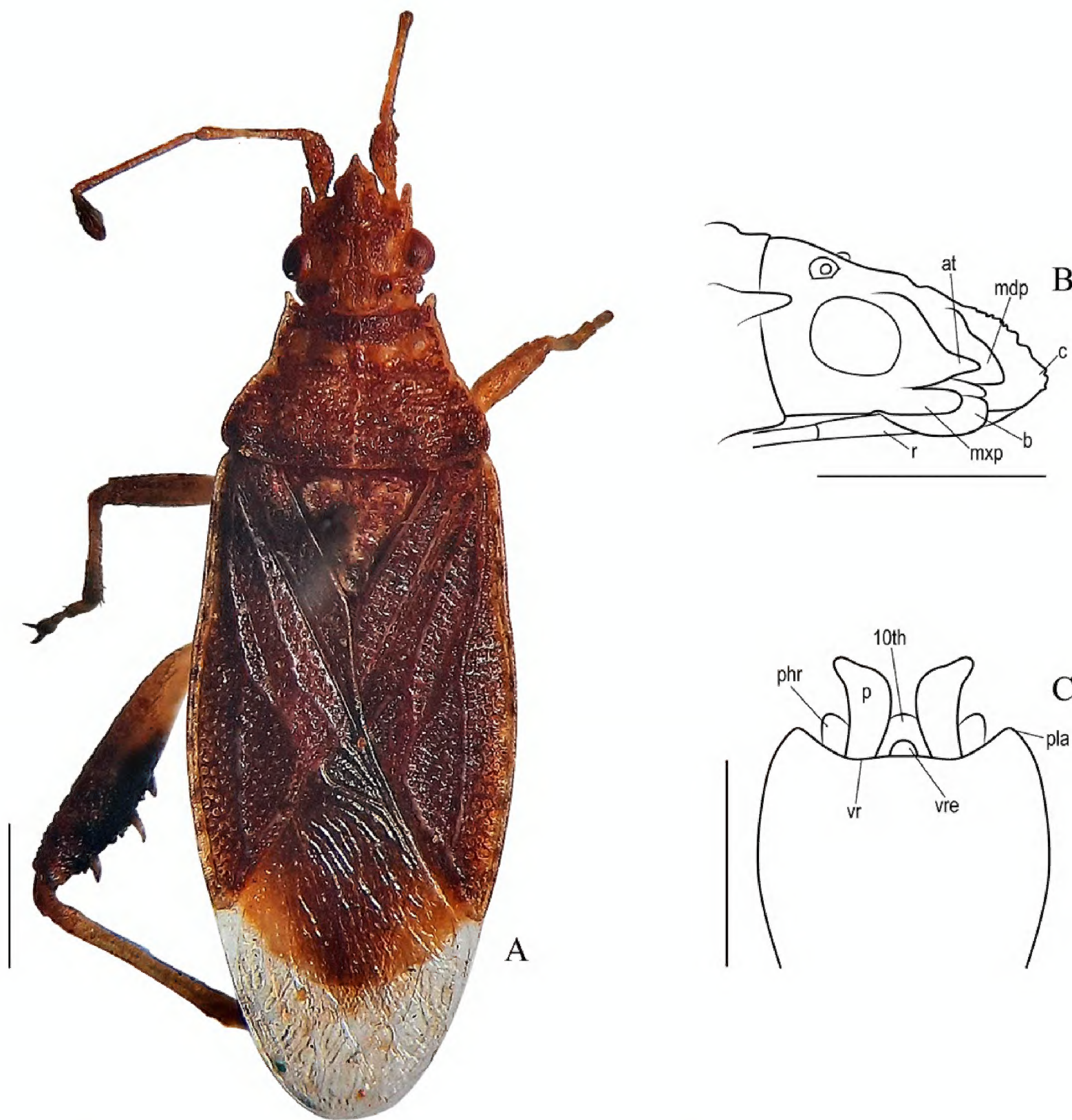


Figure 4. *Harmostes (Harmostes) parafraterculus* Göllner-Scheiding, 1978. **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: at, antennal tubercle; b, buccula; c, clypeus; phr, phragmal processes; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim; vre, ventral rim extension; 10th, tenth segment. Scale bars: A, B = 1 mm; C = 0.5 mm.

sinuous and median extension reaching half the length of the parameres. Phragmal processes attaining half or more of the length of the parameres, these rounded with small lateral sinuosity. Posterolateral angles of the pygophore markedly projected, reaching the apex of the parameres, unlike the illustration by Göllner-Scheiding (1978: fig. 36), where these angles reach only half the length. Tenth segment visible ventrally.

Males are 5.1–6.5 mm long and 1.7–1.9 mm wide, and females 6.0–6.6 mm long and 2 mm wide. Color ochre to yellowish with reddish punctations (Fig. 3A).

***Harmostes (Harmostes) parafraterculus* Göllner-Scheiding, 1978**

Figures 1C, H, 4

New records. BRAZIL – **Rio Grande do Sul** • São Francisco de Paula; 05.I. 1985; A. Lise leg.; 1 ♂, MCNZ 48533 • same locality, Pró-Mata, Potreiro Velho; 02.V.1997; 2 ♀, MCTP 15842, 15844 • same locality; 21.XI.1997; C. Weirauch leg.; 1 ♂, MCTP 40704 • same locality; 20.XI.1997;

A. Köehler leg.; 1 ♂, MCTP 40713 • same locality, Floresta Nacional de São Francisco de Paula; 10.XI.2007; L. Moura leg.; 1 ♀, UFRG • Torres, Parque Estadual de Itapeva; 13.I.2005; L. Moura & I. Heydrich leg.; 1 ♂, MCNZ 177411; 1 ♀, MCNZ 177410.

Other material examined. Type material. Holotype ♂; labeled. Santa Barbara, Serra do Caraça, Minas Gerais, Brazil, I.1970, F.M. Oliveira leg., American Museum of Natural History, New York; photo examined.

Distribution. Brazil and Argentina (Göllner-Scheiding 1979; Melo and Montemayor 2015).

Brazilian distribution. Minas Gerais, Paraná, Santa Catarina (Göllner-Scheiding 1979), Rio Grande do Sul*.

Identification. Head (Fig. 4A, B). Clypeus slightly rounded in lateral view and with small dorsal crenulations, reaching half the length of the first antennal segment. Antennal tubercles (0.29–0.36 mm) reaching the apical quarter of the mandibular plates.

Thorax (Fig. 4A). Pronotum (1–1.18 mm long and

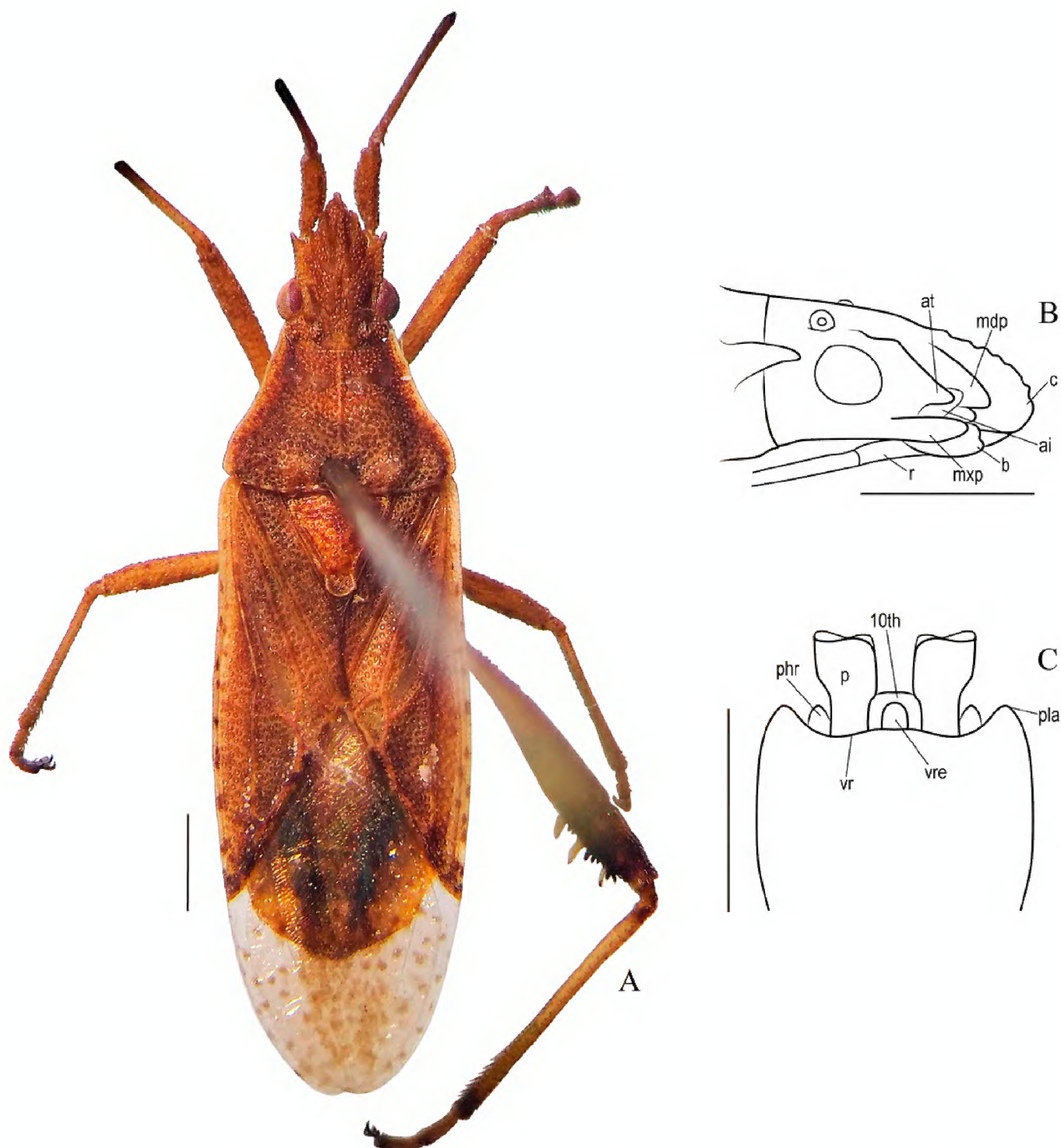


Figure 5. *Harmostes (Harmostes) prolixus* Stål, 1860. **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: ai, antennal insertion; at, antennal tubercle; b, buccula; c, clypeus; phr, phragmal processes; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim; vre, ventral rim extension; 10th, tenth segment. Scale bars: A, B = 1 mm; C = 0.5 mm.

1.7–2.09 mm wide) with anterior margin slightly concave and anterolateral angles prominent, slightly divergent. Anterolateral margins slightly concave, with small waves; humeri rounded. Apex of the scutellum rounded, about $\frac{1}{3}$ of the base width. Hemelytra with costal margin somewhat convex.

Male genitalia (Fig. 4C). Ventral rim of the pygophore sub-rectilinear; median extension of the ventral rim rounded and shorter than posterolateral angles. Posterolateral angles not attaining the apices of phragmal processes. Parameres narrow, twice as long as the phragmal processes. Tenth segment visible ventrally.

Males are 5.1–6.5 mm long and 1.7–1.9 mm wide, and females 6.0–6.6 mm long and 2 mm wide. Color reddish to reddish-brown (Fig. 4A)

Comments. Göllner-Scheiding (1979) pointed out the presence of punctations along costal margins of the corium as diagnostic for the species, but this trait also occurs in other species of the genus.

Harmostes (Harmostes) prolixus Stål, 1860

Figures 1D, H, 5

New records (12 localities). BRAZIL – Santa Catarina

• Criciúma, Parque José Milaneze; 27.XII.2004; F. Martins leg.; 1 ♂, UFRG • Urussanga; 18.I.2005; R. Teixeira leg.; 1 ♀, UFRG – **Rio Grande do Sul** • Butiá; 16.V.1982; H.A. Gastal leg.; 1 ♂, MCNZ 46732 • Derrubadas, Parque Estadual do Turvo, Estrada Salto do Yucumã; 13.V.1983; S.L. Bonatto leg.; 1 ♀, UFRG; 2 ♂, UFRG • same locality; 19.IV.2004; J.L.C. Bernardes leg.; 2 ♀, UFRG • Guaíba; 25.II.1980; same collector; 1 ♂, MCNZ 14083 • Marcelino Ramos; 08.XII.1939; 2 ♀, MCNZ 5449, 5447 • Montenegro; 03.XI.1977; M.H. Galileo leg.; 1 ♀, MCNZ 11625 • Pelotas; 01.XI.1989; J. Schneider leg.; 1 ♀, UFRG • Rio Grande, Estação Ecológica do Taim; 15.X.1985; A. Lise leg.; 1 ♀, MCNZ 49716 • same locality; 15.VIII.1985; same collector; 1 ♂, MCNZ 179007 • São Domingos do Sul; 07.III.2016; R. Brugnera leg.; 1 ♀, UFRG • Tenente Portela; 19.X.1989; N. Silveira leg.; 1 ♀, MCNZ 50278 •

Viamão; 03.XI.1963; 1 ♂, MCNZ 4659.

Other material examined. Type material. Holotype ♂; labeled: Rio de Janeiro, Brazil, Swedish Museum of Natural History, Stockholm (NHRS-GULI000001210); photo examined.

Distribution. Brazil (Berg 1879; Gibson 1917; Harris 1942; Göllner-Scheiding 1978), Bolivia (Harris 1942; Göllner-Scheiding 1978), Paraguay (Gibson 1917; Harris 1942; Göllner-Scheiding 1978), Argentina (Harris 1942; Göllner-Scheiding 1978; Melo and Montemayor 2015), Peru and Uruguay (Göllner-Scheiding 1978).

Brazilian distribution. Minas Gerais (Blöte 1934); Rio de Janeiro (Berg 1879; Gibson 1917); São Paulo (Harris 1942); Santa Catarina (Harris 1942); Rio Grande do Sul (Blöte 1934).

Identification. Head (Fig. 5A, B). Clypeus rounded in lateral view, reaching half of the first antennal segment. This segment is elongated as in *Harmostes* (*Neoharmostes*) *procerus* Berg, 1878 but distinct from the other species listed here. Antennal tubercles (0.31–0.44 mm) reaching half the length of the mandibular plates.

Thorax (Fig. 5A). Pronotum (1–1.4 mm long and 1.8–2.3 mm wide) with anterior margin rectilinear and anterolateral angles evident, directed forwards, continuous to the anterior margin, different from the illustrated by Göllner-Scheiding (1978). Anterolateral margins slightly concave and slightly angled humeri. Apex of the scutellum rounded, about $\frac{1}{3}$ of the base width. Hemelytra with costal margin rectilinear.

Male genitalia (Fig. 5C). Ventral rim of the pygophore sinuous; posterolateral angles, phragmal processes and median extension with the same extent, reaching half of the parameres length, these robust, truncated and apically angled, different from the rounded parameres and posterolateral angles of the pygophore shorter as illustrated by Göllner-Scheiding (1978). Tenth segment visible ventrally.

Males are 5.1–6.5 mm long and 1.7–1.9 mm wide, and females 6.0–6.6 mm long and 2 mm wide. Color yellowish-brown to brown (Fig. 5A).

Comments. *Harmostes* (*H.*) *prolixus* has an elongated pronotum and head, whereas the other species have a rounded and short pronotum and head. Gibson (1917) and Pall and Coscarón (2012) mentioned the occurrence of *H. (H.) prolixus* in Mexico. However, Göllner-Scheiding (1978) considered this record incorrect because Gibson (1917) described the specimen as having crenulations along lateral margins of the pronotum, and these crenulations are lacking in the species.

Harmostes (Harmostes) serratus (Fabricius, 1775)

Figures 1E, H, 6

New records. BRAZIL – Amapá • Serra do Navio, Icomi; 03.VIII.1968; 1 ♂, MCNZ 4684 – Amazonas • Tabatinga; 27.VII.1961; 1 ♀, MCNZ 4682 – Santa Catarina • Itapiranga; IX.1953; 1 ♀, MCNZ 5439 – Rio Grande do Sul • Charqueadas, Capão da Roça; 25.IX.2003; A.

Barcellos & R. Ott leg.; 1 ♀, MCNZ 176365 • Derrubadas, Parque Estadual do Turvo; 27°08'53.9"S, 053°52'00.5"W; 07.V.2004; A. Barcellos, R. Ott & I. Heydrich leg.; 1 ♂, MCNZ 176062; 2 ♀, MCNZ 176064, 176065 • same locality; 27°11'18.3"S, 053°50'38.4"W; 05.V.2004; same collectors; 1 ♀, MCNZ 175966; 3 ♂, MCNZ 175811, 175967, 175968 • same locality; 27°09'05.3"S, 053°52'00.0"W; 29.X.2003; same collectors; 1 ♀, MCNZ 54859 • same locality; 27°11'58.0"S, 053°50'42.8"W; same date; same collectors; 1 ♂, MCNZ 175014 • same locality; 27°11'43.5"S, 053°50'43.5"W; 31.X.2003; L. Moura leg.; 1 ♂, MCNZ 54953 • Estrela Velha, Itaúba; 18.IV.1978; M.H. Galileo leg.; 2 ♂, MCNZ 45209, 45210 • Gravataí, área da GM; 25.XI.1999; J. Soledar leg.; 1 ♀, MCNZ 53029 • Jaboticaba; IV.2001; D. Link leg.; 1 ♀, MCNZ 54804 • Porto Alegre, Ilha Grande dos Marinheiros; 10.VII.1999; A. Franceschini leg.; 1 ♀, MCNZ 53218 • same locality, Jardim Botânico; 04.IX.2003; L. Schmidt leg.; 1 ♀, MCNZ 54379 • Triunfo, Parque Copesul; 30.IV.2003; R. Ott leg.; 1 ♂, MCNZ 54329 • same locality; 30.VII.2003; R.S. Araújo leg.; 1 ♀, MCNZ 177462 • same locality, GCE Trilha Principal; 09.VII.2008; D. Miletho leg.; 1 ♂, MCNZ 180577.

Distribution. United States of America, West Indies, Brazil, Paraguay (Gibson 1917; Göllner-Scheiding 1978), Mexico (Berg 1879), Haiti, Panama (Harris 1942), Trinidad (Blöte 1934; Harris 1942), Central America, Venezuela, Ecuador, Bolivia (Göllner-Scheiding 1978), Colombia (Blöte 1934; Harris 1942; Göllner-Scheiding 1978), Peru (Blöte 1934; Göllner-Scheiding 1978), and Argentina (Gibson 1917; Göllner-Scheiding 1978; Melo et al. 2011).

Brazilian distribution. Amapá*; Amazonas*; Santa Catarina*; Rio Grande do Sul*.

Identification. Head (Fig. 6A, B). Clypeus rounded in lateral view and bearing dorsal crenulations, reaching half or more of the length of the first antennal segment. Antennal tubercles (0.29–0.36 mm) attaining the apical quarter of the mandibular plates.

Thorax (Fig. 6A). Pronotum (0.9–1.2 mm long and 2–2.7 mm wide) with anterior margin slightly concave and anterolateral angles not prominent. Less robust spines along the anterolateral margins, these concave and rounded humeri. Scutellum apex rounded, about $\frac{1}{3}$ of the base width, different from the illustration by Göllner-Scheiding (1978: fig. 51) in which the scutellum is more robust. Hemelytra with costal margin sub-rectilinear, distinct from those of *H. (H.) gravidator*. Male genitalia (Fig. 6C). Pygophore with ventral rim sub-rectilinear; median extension of the ventral rim rounded. Posterolateral angles short, reaching half of the phragmal processes. Parameres robust, with concave outer sides. Tenth segment visible ventrally.

Males are 5.2–6.3 mm long and 1.7–2.1 mm wide, and females 5.5–7.1 mm long and 2.0–2.5 mm wide. Color ranging from light brown to dark brown (Fig. 6A).

Comments. As in *H. (H.) gravidator*, the spines of the

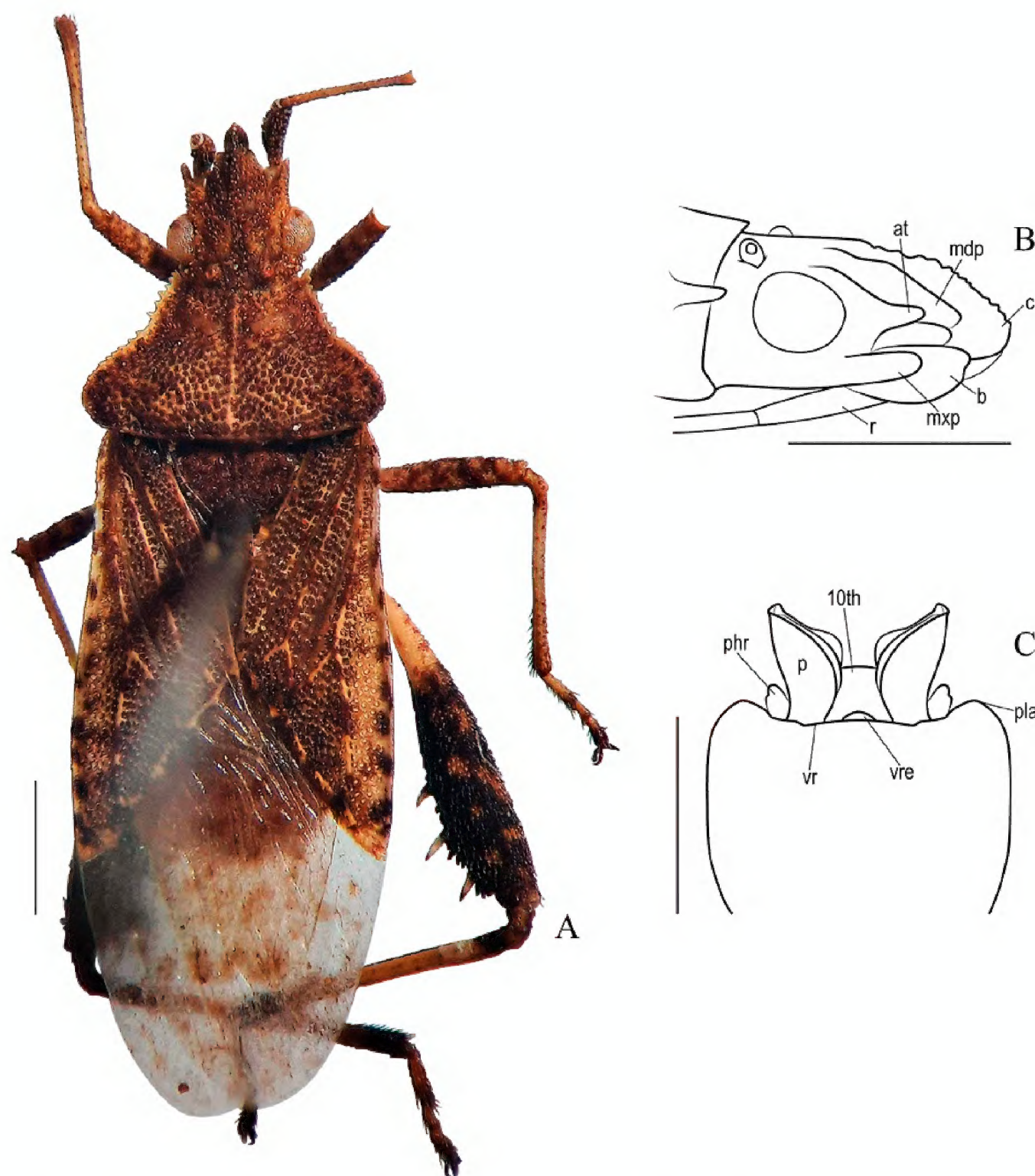


Figure 6. *Harmostes (Harmostes) serratus* (Fabricius, 1775). **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: at, antennal tubercle; b, buccula; c, clypeus; phr, phragmal processes; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim; vre, ventral rim extension; 10th, tenth segment. Scale bars: A, B = 1 mm; C = 0.5 mm.

anterolateral margins of the pronotum vary in number, size, and arrangement. Thus, other traits should be considered to better distinguish between species.

***Harmostes (Neoharmostes) apicatus* Stål, 1859**

Figures 1F, H, 7

New records. BRAZIL – **Mato Grosso do Sul** • Camapuã; XII.1967; F. Silberbauer leg.; 1 ♀, MCNZ 14740 – **Santa Catarina** (3 localities) • Abdon Batista; 10.XI.1988; J.A. Fernandes leg.; 1 ♂, MCTP 65331 • Campos Novos, Ibicuí; 02.III.1988; same collector; 1 ♀, MCTP 65329 • Florianópolis, Pântano do Sul; 01.II.1993; same collector; 3 ♀, UFRG; 2 ♂, UFRG – **Rio Grande do Sul** • Barra do Quaraí, Fazenda do Espinilho; 23.III.2003; Bunde & Schwertner leg.; 1 ♀, UFRG • Campo Bom; 25.II.1985; C.J. Becker leg.; 2 ♀, MCNZ 179238, 179239; 1 ♂, MCNZ 79236 • Farroupilha, Desvio Blauth; XI.1960; 2 ♀, MCNZ 5454, 5455 • same locality, Alto da Feliz; III.1954; L. Buckup leg.; 1 ♀, MCNZ 5446 • Palmares do Sul, Ilha Grande; 10.IV.2003; Equipe Probio leg.; 1 ♀, MCNZ 54266 • same locality; 30°21'50"S, 050°37'33"W; 08.IV.2003; same collectors; 1 ♀, MCNZ 54113 • Porto Alegre; 06.XII.1975; C. Trois leg.; 1 ♂,

MCTP 3768 • same locality; 15.X.1972; same collector; 1 ♀, MCTP 3771 • same locality; 22.II.1992; J.A.M. Fernandes leg.; 1 ♂, UFRG • Porto Mauá; 04.XII.2008; R. Moraes leg.; 1 ♀, MCNZ 180384 • Rio Grande; 08.IV.1986; A. Lise leg.; 1 ♀, MCNZ 49465; 1 ♂, MCNZ 49466 • Santa Vitória do Palmar, Estação Ecológica do Taim; 09.IV.1986; E.H. Buckup leg.; 3 ♀, MCNZ 49568, 49505, 48985 • same locality; same date; M. Rosenau leg.; 4 ♀, MCNZ 48984, 49006, 49004, 49003 • same locality; same date; L. Buckup leg.; 1 ♀, MCNZ 49569 • same locality; 17.III.1982; J. Grazia leg.; 6 ♀, UFRG; 6 ♂, UFRG • same locality; 19.III.1982; same collector; 1 ♀, UFRG • same locality; 23.III.1982; same collector; 1 ♀, UFRG • same locality; 23.III.1991; same collector; 39 ♀, UFRG • same locality; 23.III.1981; same collector; 43 ♂, UFRG • same locality; 03.II.1981; same collector; 1 ♂, UFRG • São Francisco de Assis, Sanga da Areia, Cerro Sul; 20.XIII.2009; A. Barcellos & R. Ott leg.; 1 ♀, MCNZ 181760 • São Francisco de Paula; 05.I.1985; same collectors; 1 ♀, MCNZ 48535 • same locality, Pró-mata, Potreiro Velho; 02.V.1997; Exc. Est. Faunística II; 1 ♂, MCTP 15853 • 1 ♀, MCNZ 5452.

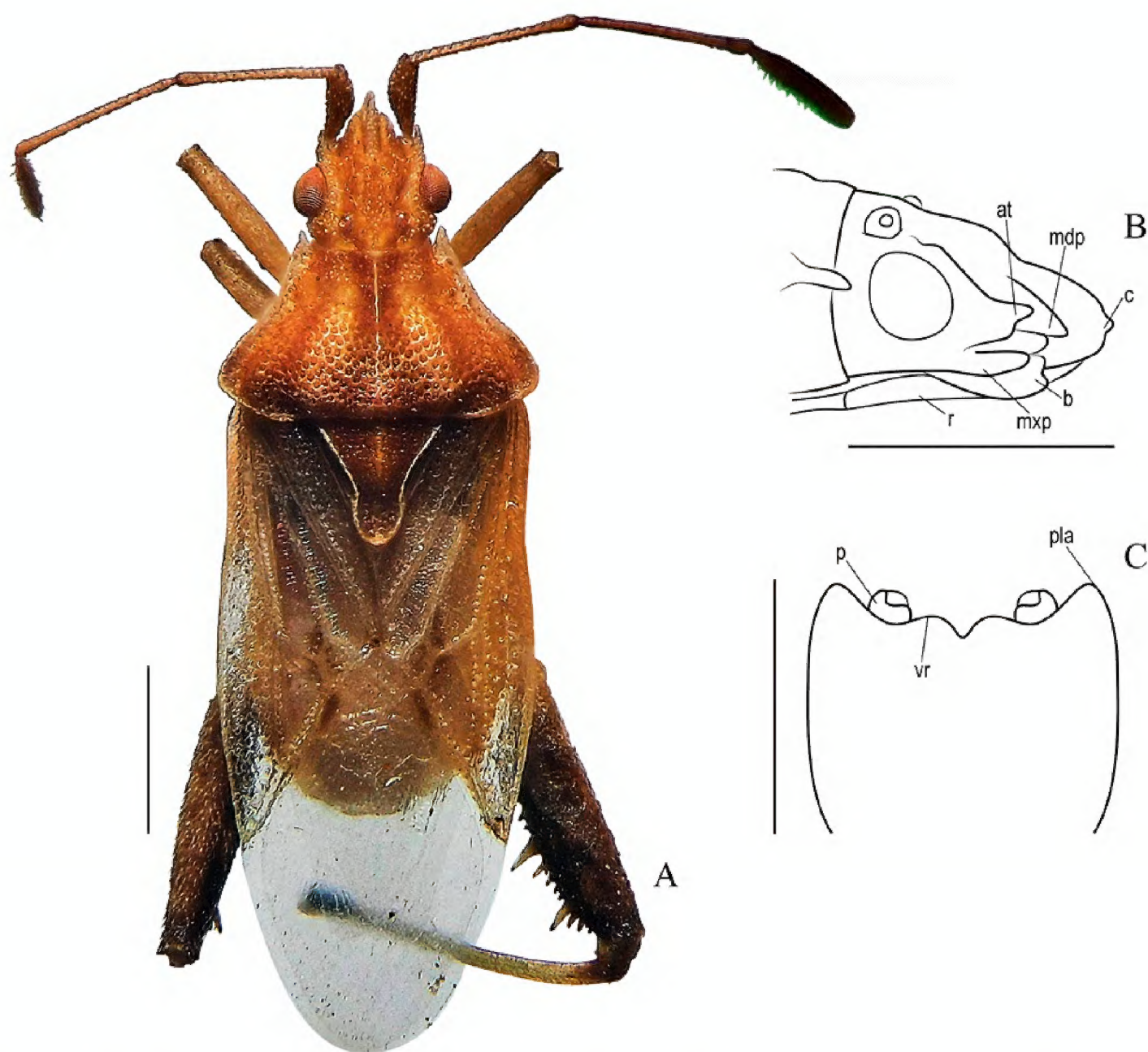


Figure 7. *Harmostes* (*Neoharmostes*) *apicatus* Stål, 1859. **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: at, antennal tubercle; b, buccula; c, clypeus; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim. Scale bars: A, B = 1 mm; C = 0.5 mm.

Other material examined. Type material. Lectotype ♀; labeled. Buenos Aires, Argentina, Kinberg leg., Swedish Museum of Natural History, Stockholm (NHRS-GULI000001209); photo examined.

Distribution. Mexico (Göllner-Scheiding 1978), Brazil, Paraguay (Berg 1879; Gibson 1917; Harris 1942; Göllner-Scheiding 1978), Bolivia (Harris 1942; Göllner-Scheiding 1978), Chile (Gibson, 1917; Göllner-Scheiding 1978), Argentina (Berg 1879; Gibson 1917; Blöte 1934; Harris 1942; Göllner-Scheiding 1978; Melo and Montemayor 2015) and Uruguay (Göllner-Scheiding, 1983).

Brazilian distribution. Pará (Harris 1942); Mato Grosso do Sul*; Santa Catarina (Harris 1942); Rio Grande do Sul*.

Identification. Head (Fig. 7A, B). Clypeus rounded in lateral view, reaching half of the first antennal segment. Antennal tubercles (0.18–0.26 mm) attaining half of the mandibular plates.

Thorax (Fig. 7A). Pronotum (0.8–1.1 mm long and 1.7–2.2 mm wide) with anterior margin rectilinear and anterolateral angles prominent, directed forward. Anterolateral margins slightly concave and humeri rounded. Scutellum apex rounded, about ½ of the base width. Hemelytra with costal margins sub-rectilinear and without punctations.

Male genitalia (Fig. 7C). Pygophore with ventral rim markedly sinuous, concave in the middle.

Göllner-Scheiding (1978: fig. 64) illustrates the posterolateral angles at the same height of the ventral edge. However, these angles are projected, equal to or greater than the parameres, which are rounded. Median extension of the ventral rim, phragmal processes, and tenth segment not visible in ventral view.

Males are 4.1–4.9 mm long and 1.3–1.6 mm wide, and females 4.6–5.4 mm long and 1.5–1.9 mm wide. Color yellow to light brown, head and pronotum with a striped pattern, varying in shades of brown (Fig. 7A).

Harmostes (*Neoharmostes*) *procerus* Berg, 1878

Figures 1G, H, 8

New records. BRAZIL – Rio Grande do Sul • Ijuí; 01.III.1996; J.A.M. Fernandes leg.; 1 ♀, UFRG • Porto Alegre; 15.X.1972; C. Trois leg.; 1 ♂, MCTP 3772 • Santa Vitória do Palmar, Estação Ecológica do Taim; 09.IV.1986; E.H. Buckup leg.; 1 ♂, MCNZ 49567 • same locality; 23.III–04.IV.1981; J. Grazia leg.; 1 ♀, UFRG; 4 ♂, UFRG.

Other material examined. Type material. Syntype ♀, labeled. Baradero, Buenos Aires, Argentina, F. Lynch leg., Museo de La Plata (MLP 1462); photo examined.

Distribution. Brazil, Peru (Göllner-Scheiding 1978), Argentina (Berg 1879; Harris 1942; Göllner-Scheiding 1978; Melo et al. 2011; Melo and Montemayor 2015), and Uruguay (Harris 1942; Göllner-Scheiding 1978).

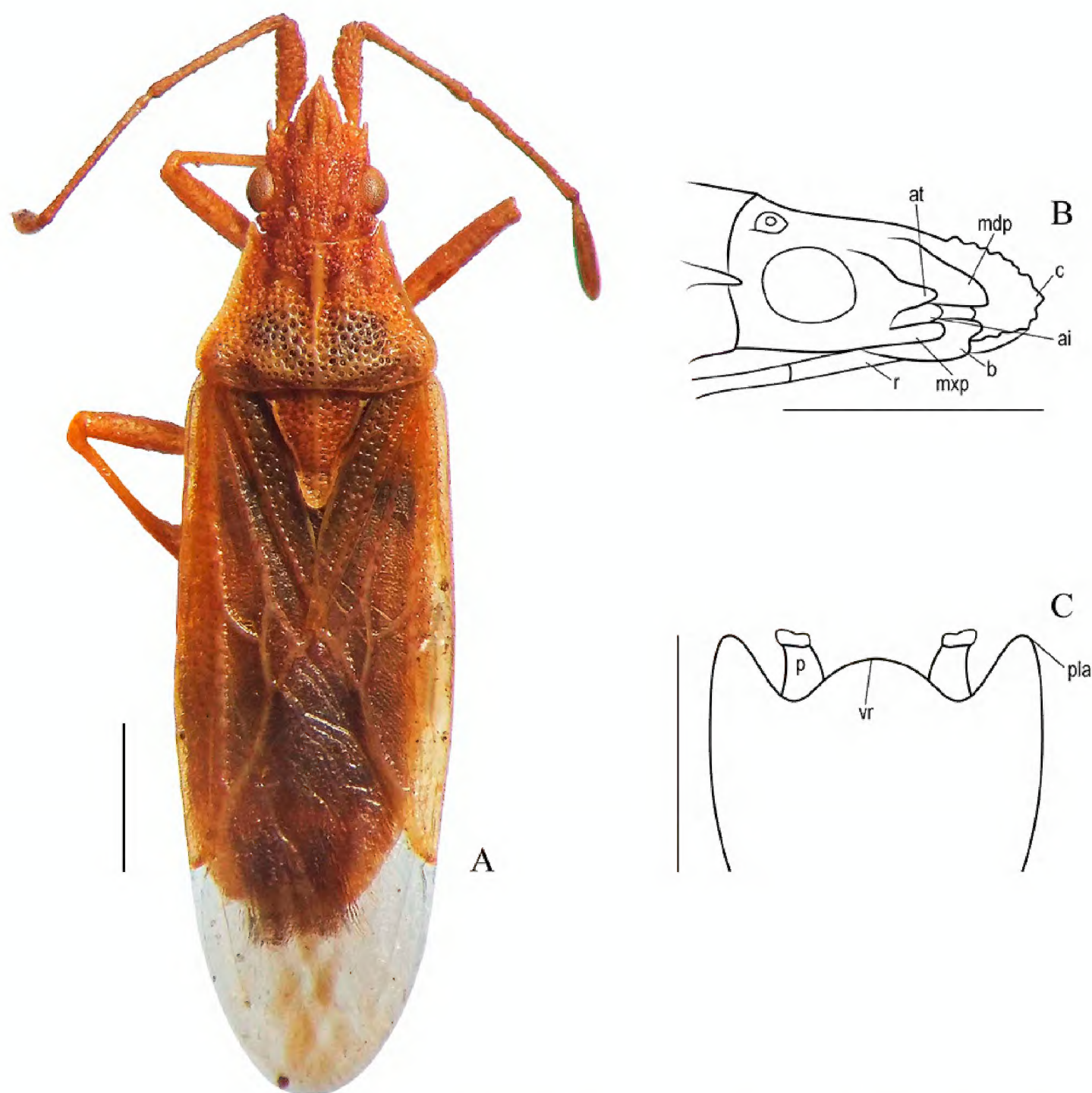


Figure 8. *Harmostes (Neoharmostes) procerus* Berg, 1878. **A.** Habitus. **B.** Head, lateral view. **C.** Pygophore, ventral view. Abbreviations: ai, antennal insertion; at, antennal tubercle; b, buccula; c, clypeus; mxp, maxillary plate; mdp, mandibular plate; r, rostrum; p, paramere; pla, posterolateral angles; vr, ventral rim. Scale bars: A, B = 1 mm; C = 0.5 mm.

Brazilian distribution. Rio Grande do Sul*.

Identification. Head (Fig. 8A, B). Clypeus elongated and rounded in lateral view and with small dorsal crenulations, reaching half the length of the first antennal segment. This elongated as in *H. (H.) prolixus* but more robust. Antennal tubercles (0.27–0.35 mm) reaching half of the mandibular plates.

Thorax (Fig. 8A). Pronotum (0.9–1.2 mm long and 1.4–2.0 mm wide) with anterior margin slightly concave and anterolateral angles prominent, directed forward. Anterolateral margins slightly concave and humeri rounded. Scutellum with subtriangular apex, about $\frac{1}{2}$ of the base width. Hemelytra with costal margins sub-rectilinear and without punctations.

Male genitalia (Fig. 8C). Ventral rim of the pygophore markedly sinuous, with a projected median third. Posterolateral angles markedly projected, reaching the length of the parameres, which are slender. Median extension of the ventral rim, phragmal processes, and tenth segment not visible in ventral view.

Males are 5.5–5.8 mm long and 1.2–1.7 mm wide, and females 6.5–6.7 mm long and 2.0–2.1 mm wide. Color yellowish to light brown (Fig. 8A).

Comments. Gibson (1917) mentioned the occurrence of

H. (N.) procerus in Argentina. However, Harris (1942) considered this record incorrect because Gibson (1917) described the specimen as having crenulations along the lateral margins of the pronotum, and these crenulations are lacking in this species.

Discussion

The new state records expand the knowledge of the geographical distribution of *Harmostes* species in Brazil, considering that some species had been cited for the country without supporting data. However, as it is based on scientific collections, the available data reflect the greater sampling effort in certain localities, more than the actual distribution of species. For this reason, we could not verify the exclusive occurrence by biome (Atlantic Forest or Pampa) of a particular species, even for *Harmostes (Harmostes) parafraterculus*, which has records only from municipalities within the Atlantic Forest biome. Thus, more sampling and access to other scientific collections are needed to verify the distributions of species in Rio Grande do Sul and to determine if there is a relationship between the biomes and species' occurrence.

The lack of specialists in Rhopalidae in the country

and dearth of taxonomic work on *Harmostes* hamper the knowledge of the distribution of this genus in Brazilian territory. A question to be investigated is the validity of the sympatric *Harmostes* (*Harmostes*) *gravidator* and *H. (H.) serratus*, as the pygophore presents intraspecific variations in both species, while interspecific differences are little evident. Traits such as the shape of the clypeus, pronotum, and antennal tubercle, which were considered diagnostic by Göllner-Scheiding (1978), are plastic in the series examined. Future taxonomic work accessing the type material and examining specimens from other collections, and including characters such as internal genitalia, will determine the possible synonymy of *H. (H.) gravidator* and *H. (H.) serratus*.

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Authors' Contributions

Data curation: TR. Formal analysis: TR. Methodology: TR. Project administration: AB. Supervision: AB. Visualization: TR. Writing – original draft: TR. Writing – review and editing: AB.

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